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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,200	02/06/2001	John Kisiday	01997/537001	8784

21559 7590 01/02/2004

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EXAMINER	
NAFF, DAVID M	

ART UNIT	PAPER NUMBER
1651	

DATE MAILED: 01/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/778,200	KISIDAY ET AL	
	Examiner	Art Unit	
	David M. Naff	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 October 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) *9-18* is/are withdrawn from consideration.

5)☒ Claim(s) *20* is/are allowed.

6)☒ Claim(s) *1-8,19 and 21-32* is/are rejected.

7)☒ Claim(s) *20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

The amendment of 10/10/03 amended claims 1, 5 and 8, and added new claims 19-32.

Claims 9-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made without traverse in Paper No. 11 of 1/6/03.

Claims examined on the merits are 1-8 and 19-32.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 25, 26 and 31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification fails to disclose "up to 50-fold" for increase in equilibrium compression modulus as required in claim 25. Page 26, lines 4-7, does not disclose the claimed limitation as asserted in the amendment.

The specification does not disclose "approximately 2-fold" as recited in claim 26. Disclosing 1.51 and 1.99 does not support approximately 2-fold which provides a different scope.

The specification fails to disclose "15 million per ml" of scaffold volume for cells present in the scaffold as required in claim 31. The number of cells disclosed at page 24, line 2, is in a casting solution. Being in a casting solution does not necessitate that the same number of cells will result per ml of scaffold volume produced from the casting solution.

Claim Rejections - 35 USC § 112

Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is uncertain as to material that would be a "sealent", "glue" or "polymer" as required in the claim. These terms have not been defined in the specification, and specific materials that can be used have not been disclosed.

Claim Rejections - 35 USC § 103

Claims 1-3, 5-8, 19 and 21-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes et al (5,955,343) in view of Hubbell (6,129,761).

Holmes et al (col 11, lines 32-35) disclose culturing cells on a membrane or matrix formed by self-assembling of peptides as required by the present claims. The peptides are stable in aqueous solution and self-assemble into a macroscopic structure or matrix when exposed to salt (col 1, lines 32-35). The structures produced can also encapsulate cells since the pore size of the structure is large enough to allow nutrients and products to diffuse, and cells are larger than the pores so the cells are contained (col 12, lines 4-9).

Hubbell discloses a scaffold for implanting containing cells encapsulated in a hydrogel (col 5, lines 55-60), and which can contain biologically active agents such as therapeutic agents (col 7, lines 15-21).

Rather than culture the cells on the membrane or matrix of Holmes et al, it would have been obvious to encapsulate the cells in the membrane or matrix as suggested by Hubbell encapsulating cells in a hydrogel for implanting and by Holmes et al disclosing encapsulating of cells in the membrane or matrix as an alternative to attaching cells to the membrane or

matrix. The membrane or matrix of Holmes et al is inherently a scaffold. The peptides of Holmes et al may be combined with collagen (col 11, lines 26-28), which is an extracellular matrix protein. Chondrocytes disclosed by Hubbell et al (col 11, line 58) produce extracellular matrix protein, and it would have been obvious to use chondrocytes to produce the collagen disclosed by Holmes et al. The collagen would have inherently resulted in an increase in strength, stiffness and equilibrium compression modulus as required by certain dependent claims. Growth factors as disclosed by Holmes et al (col 11, lines 35-38) would be a chemoattractant as in claim 2 and a polymer as in claim 21. Additionally, the membrane or matrix of Holmes et al may contain a therapeutic agent (col 11, lines 3-11) as in claim 2. The condition of claim 8 would be inherent when encapsulating cells in the membrane or matrix of Holmes et al. Compression as required by claim 30 would not result in a different membrane or matrix than obtained by Holmes et al. Moreover, handling the membrane or matrix of Holmes et al would have inherently resulted in applying some compression. Hubbell et al disclose molding (col 12, line 22) and would have suggested pre-shaping as in claim 29. Selecting an optimum amount of cells as in claim 31 for a particular function would have been within the skill of the art. Cells encapsulated in the membrane or matrix

of Holmes et al will inherently divide as in claim 32 after being placed in a culture medium as suggested by Holmes et al (col 12, lines 1-9). Peptides used by Holmes et al inherently have an adhesion site as in claim 3.

Response to Arguments

Applicants urge that Hubbell et al do not suggest using the self-assembling peptides of Holmes et al to form a hydrogel. However, self-assembling of peptides as disclosed by Holmes et al occurs in an aqueous solution and inherently results in a hydrogel. The rejection is not based on Hubbell et al suggesting forming a hydrogel, but on Hubbell et al suggesting encapsulating cells in the membrane or matrix of Holmes et al rather than attaching cells to the membrane or matrix.

Applicants refer to the procedure disclosed in the specification where cells and peptides are incubated under conditions that do not allow self-assembling, and then an electrolyte is added to cause the peptides to self-assemble. However, Holmes et al suggest this procedure when encapsulating cells by disclosing that the peptides do not self-assemble in aqueous solution until a salt is added. This procedure would have been an obvious method to use when encapsulating as disclosed by Holmes et al (col 12, lines 5-10), and is also

suggested by Hubbell et al mixing cells with a polymer solution and then crosslinking the polymer to form a hydrogel.

Claim Rejections - 35 USC § 103

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claims 1-3, 5-8, 19 and 21-32 above, and further in view of Holmes et al (PNAS).

Holmes et al disclose attaching neurons to a self-assembling peptide scaffold and growing the neurons.

When encapsulating cells in a self-assembling peptide membrane or matrix as set forth above, it would have been obvious to use neurons as the cells to obtain the function of neurons as suggested by Holmes et al (PNAS) attaching neurons to a self-assembling peptide scaffold. Holmes et al further disclose that the peptides self-assemble to form a hydrogel (first page, left col, about line 8).

Response to Arguments

Applicants rely on arguments traversing the above rejection to traverse this rejection, and assert that Holmes et al (PNAS) does not go further to establishing obviousness of the invention of claims 1-3, 5-8, 19 and 21-32. Therefore, the response set forth above to arguments also applies to this rejection.

Claim 20 is allowable, but is objected to as being dependent on a rejected claim.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Naff whose telephone number is 703-308-0520. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 703-308-4743. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

David M. Naff
Primary Examiner
Art Unit 1651

DMN
12/24/03